LABORATORY REPORT

November 22, 2011

Andy Limmer, P.G.
Aquaterra Environmental Solutions, Inc.
13 Executive Drive, Suite 1
Fairview Heights, IL 62208

RE: CH RDF Flare Gas Sample / 4733.10

Dear Andy:

Enclosed are the results of the samples submitted to our laboratory on November 9, 2011. For your reference, these analyses have been assigned our service request number P1104362.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3-R2; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-11-2; Minnesota Department of Health, NELAP Certificate No. 219474; Washington State Department of Ecology, ELAP Lab ID: C946. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson
Project Manager

Client: Aquaterra Environmental Solutions, Inc. CAS Project No: P1104362
Project: CH RDF Flare Gas Sample / 4733.10

CASE NARRATIVE

The samples were received intact under chain of custody on November 9, 2011 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Sulfur Analysis

The samples were analyzed for twenty sulfur compounds per ASTM D 5504-08 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are quantitated against the initial calibration curve for methyl mercaptan.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Use of Columbia Analytical Services, Inc. (CAS) Name. Client shall not use CAS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to CAS any test result, tolerance or specification derived from CAS's data ("Attribution") without CAS's prior written consent, which may be withheld by CAS for any reason in its sole discretion. To request CAS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If CAS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use CAS's name or trademark in any Materials or Attribution shall be deemed denied. CAS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of CAS's name or trademark may cause CAS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

DETAIL SUMMARY REPORT

Client: Aquaterra Environmental Solutions, Inc. Service Request: P1104362
Project ID: CH RDF Flare Gas Sample / 4733.10

Date Received: 11/9/2011
Time Received: 09:45

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	ASTM D5504-01 - Sulfur Bag
CW-4	P1104362-001	Air	11/8/2011	16:15	X
CW-5	P1104362-002	Air	11/8/2011	16:20	X
CW-6	P1104362-003	Air	11/8/2011	16:25	X

WM00945

Columbia Analytical Services

Air - Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

CAS Project No. P1104362

CAS Contact:

Company Name & Address (Reporting Information)
Aquaterra Environmental Solutions Inc.
13 Executive Drive Suite 1
Fairview Heights IL 62208

Project Name: GH RDF Flare Gas Sample

Project Number: 41733.10

P.O. # / Billing Information

Project Manager: Andy Limmer

Phone: (618)-628-2001

Fax: (618)628-2002

Email Address for Result Reporting: ALimmer@aquaterra-env.com

Sampler (Print & Sign): Tom Pool

Analysis Method

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	ASTM D5504 total sulfur compounds		Comments e.g. Actual Preservative or specific instructions
CW-4	1	11-8-11	1615	90675-46114	NA	NA	NA		X		Include H_2S
CW-5	2	11-8-11	1620	90675-46309	↓	↓	↓		X		↓
CW-6	3	11-8-11	1625	90675-46123	↓	↓	↓		X		↓

Report Tier Levels - please select
Tier I - Results (Default if not specified) X
Tier II (Results + QC Summaries) ____
Tier III (Results + QC & Calibration Summaries) ____
Tier IV (Data Validation Package) 10% Surcharge ____

EDD required Yes / (No)
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	11-8-11	5:00 pm		11/9/11	0845
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank Temperature ____°C

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Columbia Analytical Services™ 2655 Park Center Drive, Suite A, Simi Valley, CA 93065 | 805.526.7161 | www.caslab.com

Sample Acceptance Check Form

Client: Aquaterra Environmental Solutions, Inc. Work order: P1104362

Project: CH RDF Flare Gas Sample / 4733.10

Sample(s) received on: 11/9/11 Date opened: 11/9/11 by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
9	Was a **trip blank** received?	☐	☐	☒
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1104362-001.01	1 L Zefon Bag					
P1104362-002.01	1 L Zefon Bag					
P1104362-003.01	1 L Zefon Bag					

Explain any discrepancies: (include lab sample ID numbers): _____

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

RESULTS OF ANALYSIS

Client: **Aquaterra Environmental Solutions, Inc.**
Client Sample ID: **CW-4**
Client Project ID: **CH RDF Flare Gas Sample / 4733.10**

CAS Project ID: P1104362
CAS Sample ID: P1104362-001

Test Code: ASTM D 5504-08
Instrument ID: Agilent 7890A/GC22/SCD
Analyst: Lauryn Keeler
Sampling Media: 1 L Zefon Bag
Test Notes:

Date Collected: 11/8/11
Time Collected: 16:15
Date Received: 11/9/11
Date Analyzed: 11/9/11
Time Analyzed: 12:39
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	**27,000**	7.0	**20,000**	5.0	
463-58-1	Carbonyl Sulfide	**300**	12	**120**	5.0	
74-93-1	Methyl Mercaptan	**11,000**	9.8	**5,500**	5.0	
75-08-1	Ethyl Mercaptan	**390**	13	**150**	5.0	
75-18-3	Dimethyl Sulfide	**41,000**	13	**16,000**	5.0	
75-15-0	Carbon Disulfide	**280**	7.8	**90**	2.5	
75-33-2	Isopropyl Mercaptan	**1,500**	16	**470**	5.0	
75-66-1	tert-Butyl Mercaptan	**2,700**	18	**730**	5.0	
107-03-9	n-Propyl Mercaptan	**170**	16	**55**	5.0	
624-89-5	Ethyl Methyl Sulfide	**460**	16	**150**	5.0	
110-02-1	Thiophene	**1,800**	17	**530**	5.0	
513-44-0	Isobutyl Mercaptan	**560**	18	**150**	5.0	**W**
352-93-2	Diethyl Sulfide	**72**	18	**20**	5.0	
109-79-5	n-Butyl Mercaptan	**260**	18	**72**	5.0	
624-92-0	Dimethyl Disulfide	**310**	9.6	**82**	2.5	
616-44-4	3-Methylthiophene	**520**	20	**130**	5.0	
110-01-0	Tetrahydrothiophene	**93**	18	**26**	5.0	
638-02-8	2,5-Dimethylthiophene	**42**	23	**9.1**	5.0	
872-55-9	2-Ethylthiophene	**45**	23	**9.8**	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
W = Result quantified, but the corresponding peak was detected outside of generated retention time window.

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RESULTS OF ANALYSIS

Client: **Aquaterra Environmental Solutions, Inc.**
Client Sample ID: **CW-5**
Client Project ID: **CH RDF Flare Gas Sample / 4733.10**

CAS Project ID: P1104362
CAS Sample ID: P1104362-002

Test Code: ASTM D 5504-08
Instrument ID: Agilent 7890A/GC22/SCD
Analyst: Lauryn Keeler
Sampling Media: 1 L Zefon Bag
Test Notes:

Date Collected: 11/8/11
Time Collected: 16:20
Date Received: 11/9/11
Date Analyzed: 11/9/11
Time Analyzed: 12:58
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	**33,000**	7.0	**24,000**	5.0	
463-58-1	Carbonyl Sulfide	**300**	12	**120**	5.0	
74-93-1	Methyl Mercaptan	**12,000**	9.8	**6,200**	5.0	
75-08-1	Ethyl Mercaptan	**430**	13	**170**	5.0	
75-18-3	Dimethyl Sulfide	**41,000**	13	**16,000**	5.0	
75-15-0	Carbon Disulfide	**290**	7.8	**92**	2.5	
75-33-2	Isopropyl Mercaptan	**1,600**	16	**520**	5.0	
75-66-1	tert-Butyl Mercaptan	**2,800**	18	**760**	5.0	
107-03-9	n-Propyl Mercaptan	**200**	16	**63**	5.0	
624-89-5	Ethyl Methyl Sulfide	**460**	16	**150**	5.0	
110-02-1	Thiophene	**2,000**	17	**580**	5.0	
513-44-0	Isobutyl Mercaptan	**570**	18	**160**	5.0	**W**
352-93-2	Diethyl Sulfide	**71**	18	**19**	5.0	
109-79-5	n-Butyl Mercaptan	**290**	18	**79**	5.0	
624-92-0	Dimethyl Disulfide	**210**	9.6	**54**	2.5	
616-44-4	3-Methylthiophene	**540**	20	**130**	5.0	
110-01-0	Tetrahydrothiophene	**88**	18	**25**	5.0	
638-02-8	2,5-Dimethylthiophene	**51**	23	**11**	5.0	
872-55-9	2-Ethylthiophene	**60**	23	**13**	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
W = Result quantified, but the corresponding peak was detected outside of generated retention time window.

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RESULTS OF ANALYSIS

Client: **Aquaterra Environmental Solutions, Inc.**
Client Sample ID: **CW-6**
Client Project ID: **CH RDF Flare Gas Sample / 4733.10**

CAS Project ID: P1104362
CAS Sample ID: P1104362-003

Test Code: ASTM D 5504-08
Instrument ID: Agilent 7890A/GC22/SCD
Analyst: Lauryn Keeler
Sampling Media: 1 L Zefon Bag
Test Notes:

Date Collected: 11/8/11
Time Collected: 16:25
Date Received: 11/9/11
Date Analyzed: 11/9/11
Time Analyzed: 13:16
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	**33,000**	7.0	**23,000**	5.0	
463-58-1	Carbonyl Sulfide	**280**	12	**110**	5.0	
74-93-1	Methyl Mercaptan	**12,000**	9.8	**6,000**	5.0	
75-08-1	Ethyl Mercaptan	**420**	13	**170**	5.0	
75-18-3	Dimethyl Sulfide	**39,000**	13	**16,000**	5.0	
75-15-0	Carbon Disulfide	**270**	7.8	**88**	2.5	
75-33-2	Isopropyl Mercaptan	**1,500**	16	**500**	5.0	
75-66-1	tert-Butyl Mercaptan	**2,700**	18	**720**	5.0	
107-03-9	n-Propyl Mercaptan	**190**	16	**60**	5.0	
624-89-5	Ethyl Methyl Sulfide	**450**	16	**140**	5.0	
110-02-1	Thiophene	**1,900**	17	**560**	5.0	
513-44-0	Isobutyl Mercaptan	**550**	18	**150**	5.0	**W**
352-93-2	Diethyl Sulfide	**64**	18	**17**	5.0	
109-79-5	n-Butyl Mercaptan	**290**	18	**78**	5.0	
624-92-0	Dimethyl Disulfide	**190**	9.6	**49**	2.5	
616-44-4	3-Methylthiophene	**530**	20	**130**	5.0	
110-01-0	Tetrahydrothiophene	**88**	18	**24**	5.0	
638-02-8	2,5-Dimethylthiophene	**47**	23	**10**	5.0	
872-55-9	2-Ethylthiophene	**56**	23	**12**	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
W = Result quantified, but the corresponding peak was detected outside of generated retention time window.

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RESULTS OF ANALYSIS

Client: **Aquaterra Environmental Solutions, Inc.**
Client Sample ID: **Method Blank**
Client Project ID: **CH RDF Flare Gas Sample / 4733.10**

CAS Project ID: P1104362
CAS Sample ID: P111109-MB

Test Code: ASTM D 5504-08
Instrument ID: Agilent 7890A/GC22/SCD
Analyst: Lauryn Keeler
Sampling Media: 1 L Zefon Bag
Test Notes:

Date Collected: NA
Time Collected: NA
Date Received: NA
Date Analyzed: 11/09/11
Time Analyzed: 09:18
Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	ND	5.0	
463-58-1	Carbonyl Sulfide	ND	12	ND	5.0	
74-93-1	Methyl Mercaptan	ND	9.8	ND	5.0	
75-08-1	Ethyl Mercaptan	ND	13	ND	5.0	
75-18-3	Dimethyl Sulfide	ND	13	ND	5.0	
75-15-0	Carbon Disulfide	ND	7.8	ND	2.5	
75-33-2	Isopropyl Mercaptan	ND	16	ND	5.0	
75-66-1	tert-Butyl Mercaptan	ND	18	ND	5.0	
107-03-9	n-Propyl Mercaptan	ND	16	ND	5.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	ND	5.0	
110-02-1	Thiophene	ND	17	ND	5.0	
513-44-0	Isobutyl Mercaptan	ND	18	ND	5.0	
352-93-2	Diethyl Sulfide	ND	18	ND	5.0	
109-79-5	n-Butyl Mercaptan	ND	18	ND	5.0	
624-92-0	Dimethyl Disulfide	ND	9.6	ND	2.5	
616-44-4	3-Methylthiophene	ND	20	ND	5.0	
110-01-0	Tetrahydrothiophene	ND	18	ND	5.0	
638-02-8	2,5-Dimethylthiophene	ND	23	ND	5.0	
872-55-9	2-Ethylthiophene	ND	23	ND	5.0	
110-81-6	Diethyl Disulfide	ND	12	ND	2.5	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Aquaterra Environmental Solutions, Inc.**
Client Sample ID: **Lab Control Sample** CAS Project ID: P1104362
Client Project ID: **CH RDF Flare Gas Sample / 4733.10** CAS Sample ID: P111109-LCS

Test Code: ASTM D 5504-08 Date Collected: NA
Instrument ID: Agilent 7890A/GC22/SCD Date Received: NA
Analyst: Lauryn Keeler Date Analyzed: 11/09/11
Sampling Media: 1 L Zefon Bag Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	CAS Acceptance Limits	Data Qualifier
7783-06-4	Hydrogen Sulfide	2,380	**2,040**	**86**	51-141	
463-58-1	Carbonyl Sulfide	2,470	**1,940**	**79**	63-147	
74-93-1	Methyl Mercaptan	2,360	**2,290**	**97**	54-156	

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